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Emotion regulation difficulties, body and appearance related self-conscious emotions and eating disorders in a sample of adult women

Dificultades en la regulación emocional, emociones autoconscientes asociadas al cuerpo y a la apariencia y trastornos de la conducta alimentaria en una muestra de mujeres adultas

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Abstract. Emotional variables play a fundamental role in Eating Disorders (ED). However, there are still certain variables that have not received sufficient attention. This cross-sectional study aims to: 1) analyze the role of emotion regulation difficulties, and body and appearance-related self-conscious emotions in ED; 2) study the predictive power of emotional variables and, 3) explore the differences between types of ED in the aforementioned variables. Participants were 767 women aged between 18 and 50 years who had a diagnosis of ED, were at-risk, or healthy. The ED group, followed by the at-risk and healthy-control groups, scored higher on emotion regulation difficulties, body shame, body guilt, and lower on hubristic body pride. Specifically, emotion regulation difficulties and body shame were the two variables most predictive of ED. Likewise, the anorexia nervosa group scored, higher than the bulimia nervosa group on emotional inattention and, also higher than the other specified feeding and eating disorder group on emotional regulation difficulties and its dimension "emotional confusion" and "emotional inattention". These findings evidence the important role of emotion regulation difficulties and body shame in ED and highlight the need to work on these variables in prevention and intervention programs.

Keywords: eating disorders; emotion dysregulation; self-conscious emotions; body image.

Resumen. Las variables emocionales juegan un papel fundamental en los Trastornos de la Conducta Alimentaria (TCA). Sin embargo, aún hay ciertas variables que no han recibido suficiente atención. Este estudio transversal tiene como objetivos: 1) analizar el papel de las dificultades en la regulación emocional y las emociones autoconscientes relacionadas con el cuerpo y la apariencia en los TCA; 2) estudiar el poder predictivo de las variables emocionales y 3) explorar las diferencias entre tipos de TCA en las variables mencionadas. Las participantes fueron 767 mujeres de entre 18 y 50 años que tenían un diagnóstico de TCA, estaban en riesgo o eran sanas. El grupo de TCA, seguido por los grupos de riesgo y del sano, puntuó más alto en dificultades de regulación emocional, vergüenza corporal, culpa corporal y más bajo en orgullo corporal hubrístico. Específicamente, las dificultades de regulación emocional y la vergüenza corporal fueron las dos variables que más predijeron los TCA. Asimismo, el grupo con anorexia nerviosa puntuó más alto que el grupo con bulimia nerviosa en desatención emocional y también más alto que el grupo con otros TCA específicos en dificultades de regulación emocional y sus dimensiones "confusión emocional" Y "desatención emocional". Estos hallazgos evidencian el importante papel de las dificultades de regulación emocional y la vergüenza corporal en los TCA y ponen de manifiesto la necesidad de trabajar estas variables en los programas de prevención e intervención.

Palabras clave: trastornos de la conducta alimentaria; desregulación emocional; emociones autoconscientes; imagen corporal.

Introduction

Eating disorders (ED) refer to disturbances related to body image and food intake, mostly affecting women (APA, 2013). Currently, the prevalence of women with ED is 8.4%, four times higher than that of men (Galmiche et al., 2019). These data reflect the magnitude of the problem and, therefore, the need to investigate which variables are related to the development of ED, especially in women. This will contribute to gaining a better understanding of which emotional variables may increase the risk of developing an ED and, thus, be able to develop new and more successful preventive and therapeutic strategies. In this sense, this paper aims to

shed some light on this issue, exploring the role of some emotional variables (specifically, emotion regulation difficulties, body shame, body guilt and authentic and hubristic body pride) in the development of ED.

Emotional variables, including emotion regulation difficulties or alexithymia, seem to play an important role in both the development and maintenance of eating disorders (Prefit et al., 2019). One of the most important variables in the development of ED is emotional regulation. Emotion regulation is considered a transdiagnostic factor that refers to the attempts a person makes to modulate his or her emotional experience, influencing the intensity of the emotion and the subjective experience, physiological reactions and behaviors that accompany the emotion (Gross, 2013; Gross & John, 2003; Hughes et al., 2020; Norton & Paulus, 2017). In relation to ED, several authors believe that it can be considered maladaptive emotion regulation strategies that are activated in order to manage emotional distress (Brockmeyer et al., 2013). In this sense, each of the characteristic symptoms of these disorders would serve a specific function: to alleviate emotional distress or to provide a sense of confidence and control, among others (Williams & Reid, 2012; Wonderlich et al., 2015).

Specifically, what has been found is that people with an ED have more difficulties in identifying, describing, accepting, paying attention to, becoming aware of and regulating their emotions (Kittel et al., 2015; Harrison et al., 2016; Prefit et al., 2019). Moreover, they use, to a greater extent, emotion regulation strategies generally considered maladaptive, such as rumination, self-criticism, avoidance, emotional suppression, denial, inaction, wishful thinking and involuntary action. In contrast, they hardly use strategies generally considered adaptive, such as problem solving, emotional expression, acceptance, positive thinking or cognitive restructuring (Aldao et al., 2010; Pascual et al., 2011; Prefit et al., 2019; Svaldi et al., 2010).

In addition, other emotional variables that could play a key role in these disorders are body and appearance-related self-conscious emotions, which have received also little attention in relation to ED. Studies that have analyzed the role of these emotions in ED have focused solely on body shame, and less on body guilt and body pride. In this regard, a positive association has been found between body shame, the risk of developing an ED (Ferreira et al., 2013; Mendia et al., 2021; Mustapic et al., 2016), and the severity of the disorder (Doran & Lewis, 2012). Also, the few studies that have taken into account the role of both body guilt and body pride have found a positive association between body guilt and the risk of developing an ED (Gupta et al., 2008), whereas both authentic body pride and hubristic body pride have been negatively related to the risk of developing these disorders (Mendia et al., 2021).

The relationship between these emotions specifically and the difficulty in regulating emotions in general can be explained through previous research. According to previous studies (Evers et al., 2010), it is not so much the emotion that is felt that may lead to/protect from an ED, but the way in which that emotion is managed. Furthermore, the association between the variables under study and EDs is based on the foundations of the affect regulation model, which posits that maladaptive eating behaviors serve to escape unpleasant emotions (e.g., shame or guilt).

Regarding the differences between the different types of ED in emotion regulation difficulties, results are contradictory. Thus, it has been found that people with anorexia nervosa binge eating/purging type (AN-BP) and bulimia nervosa (BN) scored higher than people with the restrictive type of anorexia nervosa (AN-R) on emotional clarity (Anderson et al., 2018), although some studies have found no statistically significant differences between AN-R and AN-BP groups on this variable (Rowsell et al., 2016). Likewise, people with AN-R, AN-BP and BN experienced lower emotional clarity than people with binge eating disorder (BED) (Brockmeyer et al. 2014). In terms of emotional awareness, people with AN-BP had more difficulties than those with AN-R in becoming aware of their emotions (Anderson et al., 2018). Other studies, however, have found no statistically significant differences between the two groups in emotional awareness (Rowsell et al., 2016). Furthermore, although some studies found no statistically significant differences between the different types of ED in the ability to accept negative emotions (Brockmeyer et al. 2014), others found that

people with AN-BP and BN, as compared to those with AN-R, experienced more difficulties accepting negative emotions. Also, people with BN had less access to adaptive emotional regulation strategies than people with AN-R and AN-BP (Anderson et al., 2018).

Finally, regarding differences between different types of ED in body and appearance-related self-conscious emotions, the only study found showed that people suffering from BN and BED feel more ashamed of their body image than people suffering from a other specified feeding and eating disorder (OSFED) (Dakanalis et al., 2015).

Considering all of the above, the present study has three objectives: to analyze the associations between emotion regulation difficulties, body shame, body guilt, and authentic and hubristic body pride. It also aims to compare people who are likely to suffer from an ED, those who are at-risk of developing it and those who are healthy in emotion regulation difficulties, body shame, body guilt, authentic and hubristic body pride. Finally, taking into account that the differences between the different types of ED have hardly been studied in some of the variables mentioned above and that in some cases the results obtained are inconsistent (specifically, in emotion regulation difficulties), the differences between the different types of ED in all the variables mentioned above will be explored.

Based on previous studies, we expected to find a positive association between disordered eating and emotion regulation difficulties, body shame, body guilt, and negative one with authentic and hubristic body pride. In addition, we also expect to find a positive relationship between emotion regulation difficulties and body shame, and body guilt. However, emotion regulation difficulties will be negatively associated with authentic body pride and hubristic body pride.

We also hypothesized that people with a probable diagnosis of ED, compared with those at-risk and those who are healthy, would have more emotion regulation difficulties, body shame and body guilt, and less authentic body pride and hubristic body pride. Likewise, regarding the second objective, we thought that people suffering from an OSFED, compared to those suffering from AN, BN and BED, would have less emotion regulation difficulties, lower body shame, body guilt, and higher authentic body pride and hubristic body pride, as those with an OSFED do not meet all DSM-5 (APA, 2013) criteria to be diagnosed with such a disorder.

Method

Sample

A total of 438 women between 18 and 50 years (M = 29.07; SD = 9.39) were invited to participate in this online study. Almost all participants were Spanish (85.6%) or Latin American (13.4%). Although the instruments were completed by both women and men, the male sample was not sufficiently representative and only the answers given by female respondents were used in the study. A power analysis for MANCOVA was conducted. Based on a moderate effect size (Mallorquí-Bagué et al., 2018; d = 0.92), with alpha = 0.05, 95% power, and ten predictors, 27 men for each group would have been needed for the study (G*Power, Version 3.1.7, Faul et al., 2009). Unfortunately, we did not achieve the necessary sample size to include men.

Participants were classified into three groups: probable ED (n = 146; Mage = 25.57; SDage = 7.23), at-risk (n = 146; Mage = 29.21; SDage = 9.25) and healthy-control (n = 146; Mage = 32.41; SDage = 10.22). To create the probable ED group, two authors with extensive experience in the field of EDs designed a series of ad-hoc questions aimed at measuring ED traits, based on the DSM-5 (APA, 2013) and previous studies (Yilmaz et al., 2019). In this sense, the probable ED group consisted of people who mentioned having received a diagnosis of ED and presented self-reported ED traits. This is the main reason why we call this group “probable ED”. On the other hand, the risk group consisted of people who fulfilled one or more criteria of the Eating Disorders Inventory Third Edition-Referral Form (Garner, 2004; Elosua et al., 2010). Finally, the healthy group was made up of people who did not meet the criteria for having or being at risk of developing any disorder, who had never received a diagnosis of ED, and who were not receiving treatment at the time of completing the questionnaires. The exclusion criteria were the following: a) being male; b) not being between 18 and 50 years; and, c) not understanding Spanish. The participants did not receive any compensation.

Measures

DSM-5 diagnostic criteria (APA, 2013): A series of *ad hoc* questions were designed (Yilmaz et al., 2019) related to the diagnostic criteria for probable ED proposed in the DSM-5 (APA, 2013). An example of question is "Are you very afraid of gaining weight or getting fat?" (question corresponding to DSM-5 criterion B).

Body Mass Index (BMI): BMI was calculated using the Weight/Height^2 (kg/m^2) formula and participants were classified in accordance with the criteria proposed by the World Health Organization (<18.5 = Underweight; 18.5-24.9 = Normal weight; 25-29.9 = Overweight; ≥ 30 = Obese).

Eating Disorders Inventory Third Edition-Referral Form (EDI-3-RF; Garner, 2004; adapted by Elosua et al., 2010): It comprises 25 items grouped into three subscales: Drive for thinness, Body Dissatisfaction and Bulimia. This instrument allows the identification of the risk of developing an ED, which is measured based on three criteria: 1) BMI; 2) combination of the scores obtained in the subscales Drive for thinness and Bulimia, and 3) behavioral items. Individuals meeting one or more criteria were considered to be at-risk. Participants were asked to indicate how often they identified with each of the items (e.g., "I eat sweets and carbohydrates without feeling nervous") on a six-point Likert-type response scale (0 = *Never* and 5 = *Always*). In the present study, Cronbach's alpha for the different subscales ranged from .91 to .92.

Difficulties in Emotional Regulation Scale (DERS; Gratz & Roemer, 2004; adapted by Hervás & Jódar, 2008). This scale is made up of 28 items grouped into five subscales: Emotional Confusion (difficulty in identifying and knowing one's own feelings, example item: "I am confused about how I feel"), Emotional Inattention (difficulty attending to feelings, example item: "I pay attention to how I feel"), Lack of Emotional Control (difficulty controlling behavior when experiencing negative emotions, example item: "I experience my emotions as overwhelming and out of control"), Emotional Rejection ("difficulty tolerating emotional distress, example item: "When I'm upset, I become embarrassed for feeling that way"), and Emotional Interference ("difficulty concentrating on specific tasks when feeling negative emotions, example item: "When I'm upset, I have difficulty getting work done"). Participants were asked to indicate how often they identified with each item (e.g., "When I'm upset, I feel ashamed with myself for feeling that way", item related to the Emotional rejection subscale) using a Likert-type response scale (1 = *Almost never* and 5 = *Almost always*). The internal consistency coefficients (Cronbach's alpha) of the subscales ranged from .87 to .95.

Body and Appearance Self-Conscious Emotions Scale (BASES; Castonguay et al., 2014 adapted by Alcaraz-Ibáñez & Sicilia, 2018). This scale comprises 15 items grouped into four subscales: Body Shame, Body Guilt, Authentic Body Pride and Hubristic Body Pride. Participants were asked to indicate how often they identified with each item on a five-point Likert-type response scale (1 = *Never* and 5 = *Always*). An example of item is: "Guilty that I do not do enough to improve the way I look" (item related to the Body Guilt subscale). In the present study, Cronbach's alpha for the different subscales ranged from .88 to .95.

Procedure

This study was approved by the Committee for Research with Humans (CEISH) and was conducted in accordance with the Declaration of Helsinki. Following the recommendations of the ethics committee, before starting to fill in the questionnaires, participants were informed that going to the following page implied giving their informed consent to participate in the study. . Likewise, they were offered the possibility of revoking consent by email and were informed that the anonymity and confidentiality of their data would be guaranteed at all times.

An online questionnaire was prepared through the Qualtrics XM platform. The questionnaire was disseminated in 2019 through social networks. Additionally, we contacted psychologists and associations working for the prevention and treatment of ED and ask their collaboration in the dissemination of the questionnaire.

The participants needed approximately 30 minutes to complete the questionnaire. The researchers were available online to answer any questions.

Statistical analyses

Statistical analyses were carried out using the SPSS 25.0 program. First, descriptive analyses (means and standard deviations) and correlations between all the variables studied were carried out. Likewise, several Analyses of Variance (ANOVAs) were performed to analyze the differences between the main groups (probable ED, at-risk and healthy-control) and between specific probable ED types (AN, BN, and OSFED) in the studied variables. However, when comparing the specific probable ED groups, we excluded the probable BED group, given its small sample size. In addition, *Bonferroni post-hoc* tests were performed. In this way, we control the possibility of committing a Type I Error as a consequence of the multiple comparisons. Moreover, multinomial logistic regressions were carried out to analyze the associations between emotional variables and the probability of developing a probable ED. However, we only performed multinomial logistic regressions between the main groups (probable ED, at-risk and healthy-control), since we found hardly any statistically significant differences in the variables under study between the different types of ED.

Results

Relationships between the variables under study

Regarding the correlations between all the variables, it should be noted that the most noteworthy were the following: disordered eating was positively associated with emotion regulation difficulties and its dimensions, as well as with body shame and body guilt. However, it was negatively related to both types of body pride, Likewise, emotion regulation difficulties and its dimensions showed a positive correlation with body shame and body guilt, and negative correlation with authentic and hubristic body pride.

Table 1.Relationships between variables

	1	2	3	4	5	6	7	8	9	10	11
1. ED symptoms	-										
2. Emotion regulation difficulties	.731**	-									
3. Emotional confusion	.555**	.806**	-								
4. Emotional inattention	.381**	.555**	.603**	-							
5. Lack of emotional control	.699**	.932**	.676**	.361**	-						
6. Emotional rejection	.695**	.909**	.646**	.399**	.794**	-					
7. Emotional interference	.572**	.839**	.566**	.287**	.799**	.714**	-				
8. Body shame	.841**	.728**	.577**	.380**	.660**	.718**	.580**	-			
9. Body guilt	.777**	.634**	.490**	.320**	.580**	.626**	.508**	.827**	-		
10. Authentic body pride	-.219**	-.171**	-.107**	-.131**	-.139**	-.169**	-.145**	-.253**	-.206**	-	
11. Hubristic body pride	-.354**	-.292**	-.227**	-.242**	-.229**	-.294**	-.215**	-.452**	-.307**	.572**	-

p < .01

Differences between groups: probable ED, at-risk and healthy-control group

The ANOVA performed to analyze the differences between people with probable ED, those who were at-risk and those who formed the healthy-control group showed statistically significant differences in all variables (see Table 2). As can be seen in the *Bonferroni post-hoc* tests (see Table 2) we found statistically significant differences between all groups in all variables, except when comparing ED with the at-risk group and the healthy-control group in authentic body pride. Specifically, the probable ED group (followed by the at-risk and the healthy-control groups) scored higher on emotional regulation difficulties and its dimensions, body shame and body guilt. In contrast, the probable ED group scored statistically lower than the at-risk and healthy-control groups on hubristic body pride. Likewise, the at-risk group, compared to the healthy-control group, scored significantly lower on authentic body pride.

The differences between the probable ED group and the at-risk groups can be considered small to moderate, with the largest effect size relating to differences in emotion regulation difficulties (d = .78). Regarding the differences between ED and the healthy-control groups, in general, Cohen's d indicates a large effect, except with respect to hubristic body pride (d = .64), whose effect can be considered medium. Finally, with respect to the differences between the at-risk and the healthy-control groups, the differences can be considered moderate to large, except, again, for authentic body pride (d = .29) and hubristic body pride (d = .37), for which rather small differences were found.

Multinomial logistic regressions

The multinomial logistic regression analysis was carried out with the aim of exploring the effects of emotional variables on the probability of being at-risk of developing an ED or of suffering from it. The model proposed in the analysis was based on both theoretical and empirical criteria and according to the principle of parsimony. It was composed of the following variables: emotion regulation difficulties and body shame. This model was statistically significant, χ^2 (4) = 669.98, p = .0001, and explained 66.6% of the variance. The results showed that, being a healthy person, for each unit of intensity that emotion regulation difficulties increased, the probability of being at risk of developing an ED was 5.824 times higher, while the probability of suffering an ED was 11.739 times higher. Likewise, for each unit of increment in the intensity that body shame was experienced, the probability of being at risk of developing an ED and of suffering from ED increased to

Table 2. Differences between the ED, at-risk and healthy-control groups in the variables under study

	Probable ED			At-risk			Healthy-control			*F*	*p*	*Eta²*
	M	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*			
Emotion regulation difficulties	3.54[a]	0.74	146	2.89[a]	0.87	284	1.73[a]	0.44	335	420.51	**.0001**	.52
Emotional confusion	3.19[a]	1.11	146	2.51[a]	1.02	284	1.65[a]	0.61	336	170.94	**.0001**	.31
Emotional inattention	3.05[a]	1.06	146	2.60[a]	1.04	284	2.12[a]	0.83	335	50.57	**.0001**	.12
Lack of emotional control	3.44[a]	1.02	146	2.76[a]	1.05	284	1.45[a]	0.44	336	352.59	**.0001**	.48
Emotional rejection	3.91[a]	0.94	146	3.19[a]	1.22	284[a]	1.69[a]	0.66	336	337.54	**.0001**	.47
Emotional interference	3.97[a]	1.08	146	3.37[a]	1.13	284	2.12[a]	0.81	336	217.89	**.0001**	.36
Body shame	4.11[a]	0.86	146	3.41[a]	1.05	284	1.85[a]	0.66	337	441.42	**.0001**	.02
Body guilt	4.30[a]	0.81	146	3.81[a]	1.02	284	2.32[a]	0.91	337	304.11	**.0001**	.06
Authentic body pride	2.20	1.04	146	2.14[a]	0.90	284	2.41[a]	0.92	336	6.63	**.001**	.54
Hubristic body pride	1.71[a]	0.84	146	1.94[a]	0.88	284	2.27[a]	0.89	336	24.26	**.0001**	.44

Note. Groups with the same letter are signifcantly diferent.

a less extent, specifically 3.999 and 6.427 times more, respectively. However, when being at risk of developing an ED, for each unit of intensity that emotion regulation difficulties increased, the probability of suffering from anED increased 2.015 times. In the case of body shame, this probability was somewhat lower: 1.607 times (see Table 3).

As for different types of ED, we only found statistically significant differences for the difficulties in regulating emotions and its dimensions "emotional confusion" and "emotional inattention" (see Table 4). *Bonferroni's post-hoc* tests showed some statistically significant differences between the groups: the AN group scored higher than the probable BN group on emotional inattention with a medium size effect. Likewise, the probable AN group, compared to the probable OSFED group, also obtained higher scores in the difficulties in regulating emotions and their dimensions "emotional confusion", and "emotional inattention" (see Table 4).

Discussion

The aim of this study was to analyze the relationship between emotion regulation difficulties and body and appeareance-related self-conscious emotions (body shame, body guilt and body pride) in a sample of adult women. For this purpose, the differences between several groups were studied (on the one hand, a group of people with probable ED, at risk of developing ED and a healthy-control group and, on the other hand, three groups of people with probable AN, BN and OSFED), as well as the extent to which these variables predicted being in one group or another.

Regarding the first objective, the correlation analyses, it should be noted that, as our hypothesis indicated, disordered eating was positively associated with emotional regulation problems, as well as with experiencing unpleasant emotions, such as body shame or body guilt (Nechita et al., 2021; Prefit et al., 2019; Solomon-Krakus

Table 3. Predictive ability of emotion regulation difficulties and body shame

	PROBABLE ED			AT-RISK			HEALTHY-CONTROL		
	β	*OR*	*CI 95%*	*β*	*OR*	*CI 95%*	*β*	*OR*	*CI 95%*
Emotion regulation difficulties	2.463	11.739	[7.18,19.17]	1.762	5.824	[3.85,8.79]		1 [Ref]	
	0.701	2.015	[1.49, 2.72]		1 [Ref]		-1.762	0.172	[0.11,0.25]
Body shame	1.860	6.427	[4.38,9.42]	1.386	3.999	[2.94,5.43]		1 [Ref]	
	0.474	1.607	[1.24,2.07]		1 [Ref]		-1.386	0.250	[0.18,0.34]

Table 4. Differences between types of probable ED in the variables under study

	Probable AN			Probable BN			Probable OSFED			*H*	*p*	*Eta²*
	M	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*			
Emotion regulation difficulties	3.68[a]	0.70	90	3.36	0.75	18	3.31[a]	0.78	32	7.52	.023	56
Emotional confusion	3.50[a]	1.08	90	2.84	0.91	18	2.60[a]	1.08	32	17.26	.0001	.19
Emotional inattention	3.34[ab]	1.04	90	2.54[a]	0.90	18	2.61[b]	0.94	32	16.41	.0001	.21
Lack of emotional control	3.51	1.06	90	3.40	1.14	18	3.33	0.86	32	1.30	.521	.20
Emotional rejection	4.01	0.91	90	3.66	0.86	18	3.83	1	32	3.25	.197	.21
Emotional interference	4.05	1.05	90	4.09	1.09	18	3.75	1.14	32	2.06	.355	.09
Body shame	4.15	0.80	90	4.05	0.98	18	4.09	0.88	32	0.07	.966	.11
Body guilt	4.34	0.76	90	4.31	0.84	18	4.20	0.79	32	0.94	.623	.04
Authentic body pride	2.27	1.12	90	2.26	0.97	18	2.10	0.89	32	0.39	.820	.07
Hubristic body pride	1.65	0.87	90	2.11	0.88	18	1.74	0.73	32	4.47	.107	.10

Note. Groups with the same letter are signifcantly diferent.

& Sabiston, 2017). However, disordered eating was negatively related to pleasant emotions, such as authentic and hubristic body pride (Mendia et al., 2021). Likewise, emotion regulation difficulties were positively associated with body shame and body guilt, and negatively associated with both body pride (Goss & Gilbert, 2002; Urry & Gross, 2010).

Secondly, if we refer to the comparison between the probable ED, at-risk and healthy-control group, our hypothesis was partially fulfilled, since we found no statistically significant differences between all groups in authentic body pride. Despite this finding, emotional regulation difficulties (specifically, lack of emotional control and emotional rejection) body shame, body guilt and hubristic body pride seem to play a relevant role, since the probable ED group scored higher than the at-risk group and the healthy-control group in these variables. These results show that, in general, the probable ED group presents a more negative emotional profile than the at-risk group and the healthy-control group.

These findings are in line with the thinking of many authors, who suggest that EDs are emotional regulation strategies (Brockmeyer et al., 2013) and can be explained through the affect regulation model and the theory of self-discrepancies (Higgins, 1997). The affect regulation model postulates that negative affect is elevated before engaging in risky eating behavior (restraint, vomiting, binge eating...), while positive affect is decreased. Likewise, as Higgins (1997) states, in order to understand the relationship between body and appearance-related self-conscious emotions and the risk of developing an ED, it is useful to refer to two different concepts: the real body and the ideal body. What happens when there are discrepancies between both of them? In this situation, people become aware of those physical characteristics of their body image perceived as less attractive and, therefore, it will be easier for them to feel more body shame and less body pride (Bessenoff & Snow, 2006; Mackowiak et al., 2019). To manage these unpleasant emotions, the person may try, by all means, to modify the body shape, to the point of engaging in risky eating behaviors, including dietary restraint, self-induced vomiting, or engaging in the opposite behaviors such as binge eating (Duarte et al., 2015).

On the other hand, one of the most surprising results is related to authentic body pride, since the probable ED group does not present lower levels than the rest of the groups in this variable. However, the at-risk group scored lower than the healthy-control group. These results are in line with previous studies (Mendia et al., 2021) and lead us to think that people with probable ED are very self-demanding, a self-demand that leads them to not feel proud of the behaviors they perform to modify their body image. This is a hypothesis that should be tested in future research, since we have not found any study that explores this question.

In addition, as multinomial logistic regressions show, among all the emotional variables analyzed, emotion regulation difficulties and body shame were the variables that were most strongly associated with the probability of being at risk of developing an ED or suffering from it. More specifically, emotion regulation difficulties was the variable that showed the greatest association. According to previous studies, the acquisition of emotional regulation strategies was related to lower levels of disordered eating (MacDonald & Troittier, 2019). On the other hand, these results are also consistent with other studies in which high levels of body shame were associated with disordered eating (Troop & Redshaw, 2012).

When we compare the specific types of ED on the variables under study, we hypothesized that the probable OSFED group, compared to the AN and BN groups, would have a more positive profile and, therefore, would score significantly lower on all dimensions of emotion regulation difficulties, body shame, and body guilt, and higher on authentic and hubristic body pride. However, we hardly found statistically significant differences between the specific probable ED groups; in line with our hypothesis, the AN group presented more emotional confusion than the probable OSFED group and more emotional innatention than the OSFED and BN groups. This could be because people with AN have low levels of self-esteem (Zamani Sani et al., 2020) and high levels of cognitive rigidity (difficulties in changing thoughts or behavior in response to environmental demands (Talbot et al., 2015) ,which leads them to have more emotional regulation problems (Cai et al., 2018;

Garofalo et al., 2015). Likewise, although we expected to find differences between some types of ED on body and appearance-related self-conscious emotions, we did not. This result is not surprising, since worry and negative emotions related to body image are present in all types of ED (APA, 2013).

Theoretical and practical implications

This work has relevant theoretical and practical implications. At a theoretical level, it makes a relevant contribution, since it broadens scientific knowledge about the association between some emotional variables (especially, emotion regulation difficulties, body shame, and body guilt) and the probability of developing an ED. Likewise, the fact of using a sample of adults is one of the great contributions of this work, given that a relevant percentage of people who develop an ED are adults (Gagne et al., 2012) and, that most studies have used samples of adolescents (Casagrande et al., 2020; Mustapic et al., 2016; Pascual et al., 2011). In this sense, this work allows us to analyze whether the results obtained in samples of adolescents can be extrapolated to samples of adults or whether, compared to adolescents, adults show an emotional profile with certain particularities that should be taken into account when preventing and intervening on EDs. Likewise, this research delves into the role played by body and appearance-related self-conscious emotions in these disorders, which, to date, have not received the necessary attention and that have been shown to play a relevant role in these disorders, especially the negative ones.

On a practical level, these results point to the need to pay attention to emotion regulation difficulties and body shame, and, thus contributing to the prevention and intervention of these disorders. Specifically, it is important to offer adaptive emotional regulation strategies so that people can manage their emotions without resorting to risky eating behaviors, as well as to teach people that emotions, whether pleasant or unpleasant, are not dangerous and, therefore, it is not necessary to escape from them.In this regard, one of the skills that is proving its effectiveness to improve emotional regulation, while decreasing behaviors related to maladaptive eating is mindfulness (Franco et al., 2017; Sala et al., 2020; Soriano-Ayala et al., 2020).

Limitations and future research

Findings from this study should be considered in light of their limitations. Firstly, the diagnosis of probable ED was made by a self-reported online questionnaire i.e., ED tait were self-rated. Having used self-reported questionnaires could have left out some variables that are key to the diagnosis of ED, such as weight, height or BMI. It would be relevant for future studies to conduct clinical interviews to assess key aspects of food intake (e.g., quality, quantity, and frequency of intake) and the degree of body image distortion. Also, when interpreting the results, it is essential to take into account that people suffering from a probable ED may have other comorbid disorders (e.g. anxiety disorder, post-traumatic stress disorder, etc.). It should also be noted that the lack of background information on the sample may bias the comparison. Likewise, when creating the group of women with AN, we did not differentiate between AN-R and AN-BP, which does not allow us to explore the differences between the two subtypes. Likewise, the sample is made up only of women, so the results can not be generalized. In this sense, it would be necessary for future research to include samples of men in order to delve more deeply into how men develop these disorders. Similarly, the cross-sectional study design does not allow us to elucidate the direction of the results, i.e., we cannot ascertain whether the emotional variables appear as antecedents of the EDs or as a consequence. In thin sense, future longitudinal research is needed. Finally, the results may be influenced by social desirability bias, since most of the instruments used were self-reports.

Despite the limitations, this work makes a relevant contribution to the field of ED and highlights the need to pay attention to emotional variables, in particular to emotion regulation difficulties, body shame and body guilt when making ED prevention and intervention.

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